Science

Syllabus

Grade 09

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)
1.0 Explores life and life processes in order to improve productivity of biological systems	1.6 Examine the structural and functional relationship of the human skin	• Basic structure of the human skin • Basic functions of the skin	**Students should be able to:** • explain major functions of the human skin • draw an outline diagram of the human skin and label the major parts • collect information on some treatment done on the skin and their effects • accept the importance of maintaining healthy skin • accept the need for avoidance of unnecessary treatments on the skin	• Competency levels1.4 and 1.5 have been removed. • Discuss only the structure and functions of human skin	**0**1
	1.7 Investigates some plant processes that ensure the survival of plants and protection of the environment	• Mechanisms involved in the transport of materials in plants • Osmosis • Diffusion • Some processes involved in plants • Transportation • Transport of water • Transport of minerals • Transport of food	**Students should be able to:** • conduct simple activities to demonstrate diffusion and osmosis • describe diffusion and osmosis as major modes of transportation in plants • conduct simple activities to show the transportation of water • state appropriate examples for transport of soluble minerals and food substances by plants through their transport system • accept the importance of material • transportation for the survival of plants	• Photosynthesis, trans potation and transpiration will be discussed in grade11 • Osmosis, diffusion, guttation should be discussed in grade 8	**0**4

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)

		• Transpiration
		  • Process
		  • Adaptations of plants to reduce transpiration
		  • Importance of transpiration
		• Guttation
		  • Raw materials
		  • Products
		  • Importance
		• Life cycle of an organism
		  • Plant
		  • Animal
		• Different types of life cycles
		  • Life cycles with metamorphism
			• design and conduct suitable activities to show transpiration in plants
			• investigate and report the adaptations of plants for minimizing transpiration with suitable examples
			• accept the importance of transpiration
			• distinguish between guttation and transpiration		

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)
	1.8 Observe and understand the life cycle of an organism	• Life cycles without metamorphism • Economical value of life cycles	**Students should be able to:** • Diagrammatically illustrate that every living being has a life span which is completed with a lifecycle • Illustrate and compare life cycles of the human and the butterfly • describe the term metamorphism • give examples for life cycles with metamorphism(frog)and lifecycles without metamorphism • Differentiate complete and in complete metamorphism • Give examples for complete and incomplete metamorphism • Illustrate life cycle of a flowering plant diagrammatically • Collect available specimens of the stages of life cycles and display the mina suitable manner • Identify the stages of life cycles of pests with the view to controlling them successfully. • Accept that the stages of life cycles can be need to control pests effectively • Accept the importance of protecting the sensitive stages of life cycles to conserve biodiversity	• Observations should be arranged before lesson • Basics of life cycles should be done. • Competency level 1.9 has been removed.	02

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)
	2.3 Explore the effect of changes in matter occurring in the environment	• Law of conservation of mass • Combustion	**Students should be able to :** • state the law of conservation of mass using the results of the activities performed • describe combustion as a chemical reaction between a combustible substance and supporter of combustion • describe fire triangle and requirement of reaching the ignition point for breaking out a fire	• Physical and chemical changes will be discussed in grade 10 • Law of mass and combustion (Discussion only).	02
	3.3 Gains experiences on productive uses of magnets	• Magnets • Permanent magnets • Magnetic poles • Field patterns of bar magnets • Applications of permanent magnets • Earth magnetism and compass	**Students should be able to :** • conduct a simple activity to identify the substances as magnetic and non magnetic • use different methods to demonstrate the magnetic field around a bar magnet • describe that the region around a magnet where it has a magnetic effect as the magnetic field • identify north and south poles of magnets • explain what earth magnetism is • explain compass as the equipment which can be used to find the direction of magnetic fields • use the compass appropriately to find earth's magnetic north • state that there is a difference between magnetic north and geographical north	• Teacher should do demonstration on usage of magnets	04

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)
			• conduct simple activities to make permanent magnets by stroking and electrical methods • explain that permanent magnets are made of materials which retain magnetic properties for a long time • state that steel is suitable to make permanent magnets and soft iron is suitable for temporary magnets • use and keep magnets in a proper manner • give examples for applications of permanent magnets		
	3.4: Develop awareness of basic quantities related to current electricity and measure those quantities using relevant instruments	• Quantities related to current electricity and measuring those quantities • Voltage • Electric current • Resistance	**Students should be able to:** • explain electric potential with suitable examples • explain voltage as a potential difference • state the unit of voltage as 'volt '(V) • measure the voltage between two given points in a circuit using a voltmeter correctly • describe that flow of current is from higher potential to the lower potential • state that the direction of current is from the positive terminal to the negative terminal • state the unit of electric current as the 'ampere' (A) • measure the value of current passing a given point of a circuit using an ammeter correctly	• Should be combined with 3.5 as the theory discussed is common to both competency levels	06

Competency	Competency level	Contents	Outcomes	Remarks	Time (Periods)
			• explain resistance as a property which opposes the passage of an electric current through a conductor • explain the unit of resistance as 'ohm (Ω) • accept of the importance of measuring electrical quantities correctly		

	3.5 Uses simple electrical appliances productivity in day to day activities	• Connection of cells and bulbs
		  • Series
		  • Parallel
		• Simple electrical circuit
		  • Torch
		  • Light decorations
		• Safety and economic uses of electrical appliances at home environment
		  • Current controlling components
		  • Switches
		  • Fixed resistors
		  • Variable resistors
		  • Rheostat
		  • LDR
			Students should be able to:
			• construct simple electrical circuits in series and in parallel using the given circuit diagrams
			• explain the observations on the circuits in series and in parallel
			• draw the circuit diagram of a torch
			• state that a bulb lights up only when the circuit is completed
			• build suitable light decoration circuits according to given situations
			• use circuit assembling tools effectively
			• use current controlling components to control the current in a circuit appropriately		

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)
			• list out safety measures to be taken when using electrical appliances in the home • collect information on the electrical appliances used at home and select more effective and efficient appliances		
	3.6 Use the effects of electricity efficiently in day to day life	• Effects of electricity • Heating effect • Lighting effect • Magnetic effect • Chemical effect	**Student should be able to;** • conduct simple activities to show the thermal effect, the lighting effect, the magnetic effect and the chemical effect of electricity • investigate applications of the thermal effect of electricity in day to day life • construct simple appliances to show the lighting effect of electricity using LED • construct a simple electromagnet and demonstrate the methods of changing its strength	• Teacher demonstration • Practical component should be rearranged according to the time	**04**

Competency	Competency level	Content	Outcomes	Remarks	Time (Periods)
			• construct simple working models using the magnetic effect of electricity • demonstrate the application of the chemical effect of electricity in day to day life • construct innovative products using the effects of electricity • explain that electricity can be transformed into various types of energy • accept that the effects of electricity can be used productively in day to day life		

Competency	Competency level	Content	Outcomes	Remark	Time (Periods)
4.0. Explores nature, properties and processes of earth and space by understanding natural phenomena for intelligent and sustainable utilization	4.1 Inquire in to information on the solar planetary system, space and space exploration. 4.2. Develop skills to demonstrate the solar planetary system and some important phenomena related to it.	• Sun, Earth and moon • Rotation and revolution of the Earth • Seasons • Phases of moon • Eclipses • lunar eclipse • solar eclipse • Solar planetary system • Constellations • Constellations in the zodiac • Other constellations • Space exploration • Artificial satellites	**Student should be able to;** • construct various models to demonstrate the rotation and revolution of the Earth and the moon • use models to describe the occurrence of seasons • illustrate phases of moon diagrammatically • use models to demonstrate lunar and solar eclipses • describe occurrence of lunar and solar eclipses using ray diagrams • construct various models to illustrate the solar planetary system • identify major constellations and name important stars belongings to some constellations • identify planets and stars by observing the night sky • state that selected twelve constellations in the path of the apparent motion of earth is termed the zodiac	• Students should prepare a booklet on space travel and it's uses • Activity on zodiac constellations should be done by the students	**05**

Competency	Competency level	Content	Outcomes	Remark	Time (Periods)
			• present information related to space exploration and artificial satellites using attractive ways • accept the importance of artificial satellites in communication systems • accept that all space exploration activities should be aimed at the wellbeing of humankind		
	4.3. Investigates the scientific basis of climatic changes related to natural disasters.	Scientific basis of • Drought • Flood • Landslide • Lightning	**Students should be able to;** • describe the causes for natural disasters (i.e. drought, flood, landslide and lightning) • use various models to demonstrate the scientific basis of natural disasters mentioned above • accept the importance of taking precautions to minimize damages caused by natural disasters • appreciate the importance of communication to minimize damages caused by natural disasters	• Explain the basic theory of drought, flood and landslides • Assignment should be given to find out information on natural disasters • Lightning will be discussed in grade 9.	**02**

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
1.0 Explores life and life processes in order to improve productivity of biological systems	1.1 Investigate the application of micro-organisms.	Micro-organisms • Bacteria • Fungi • Protozoa • Algae • Viruses • Environments and substrates of micro-organisms • Effect of micro-organisms • Favorable • Unfavorable	**Student should be able to :** • group micro-organisms by observing characteristics as bacteria, fungi, protozoans and algae giving examples. • identify viruses as a group in-between the living and non-living. • State thatt viruses multiply only inside living cells and are devoid of a cellular organization. • state thatt unicellular and multicellular micro- organisms are found within the groups of micro-organisms. • state that micro-organisms can live even under the extreme environmental conditions. • name meat, fish ,fruits, human skin, mouth, alimentary canal, reproductive organs and soil as the specific substrates in which micro-organisms grow. • describe how various micro-organisms are used in activities carried out for economic gain and research(agriculture, medicine, industries) • state that micro-organisms are employed in environmental conservation ,decomposition of oil spilled on oceanic waters, absorption of heavy metals, recycling of plastics.)	• Assignment on usages of microbes should be given	06

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

	1.2 Reviews eye and ear as sense organs.	• Eye
		  • Structure
		  • Functioning
		  • Visual defects, complaints and remedies
		• Ear
		  • Structure
		  • Functioning
		  • Complaints in the ear
			• state diseases, food spoilage and use of micro-organisms as chemical weapons as unfavorable effects of micro-organisms.
			
			Student should be able to :
			• briefly describe the basic structure of the human eye with the help of models or diagrams.
			• briefly describe how an image is formed on the retina of the eye
			• briefly explain the importance of binocular vision and stereoscopic vision of the human through activities.
			• state that long sightedness and short sightedness are defects of vision.
			• briefly explain how lenses are used to correct the defects of vision using diagrams.
			• state that cataract and glaucoma are frequent complaints in the eye at present.
			• accept that protective measures should be followed before preventing complaints in the eye.
				• Briefly explain about eye and ear using models. (Drawing ray diagrams is not required)	**04**

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
		•	• accept that protection of the eye as an important organ is momentous. • briefly describe the basic structure of the human ear using models or diagrams. • state that the main functions of the ear are receiving auditory senses and maintaining balance of the body. • name cochlea and semi-circular canals as the structures relevant to the major functions of the ear. • state that causes leading to the complaints in the ear be prevented. • becoming aware of the ranges which the ear can withstand, accepts that it is essential to protect as a sensory organ .		

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

	1.3 Discloses the structure-function relationships related to the human blood	• Blood circulatory system
		• Blood
		  • Components
		  • Function
		  • Blood groups
		  • Blood transfusion and agglutination·
		• Clotting of blood
		• Structure of the heart
		• Chambers of the heart, valves, walls, main arteries and veins, coronary artery.
		• Structure of arteries, veins and capillaries
			Student should be able to;
			• state the components of blood and their functions.
			• state transport and protection as the main functions of blood.
			• state that there are four blood groups A, B, AB and O depending on the protein components contained in blood cells.
			• state that blood transfusion is the transference of blood of one individual(the donor) to the body of another(the acceptor/recipient).
			• state that if incompatible blood types are mixed during transfusion , agglutination occurs.·
			• illustrate the compatibility of blood groups in transfusion, by using a table
			• States three requirements of a blood donor.·
			• state that clotting of blood is an important protective event during bleeding.
				• Briefly discuss about blood groups. Rh factor not required
				(Human circulatory system will be discussed in gr 10)
					04

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
	1.4 Reviews the plant growth sub-stances.	• Plant growth substances • Auxins • Cytokinins· • Gibberellins	**Student should be able to;** • state that plants contain chemical substances which control their physiological functions. • describe the effect of growth promoting substances on the growth of plants. • explain the effects caused by various growth-promoting substances in plants. • accept that artificial growth-substances can induce physiological effects	• Conduct a discussion on growth substances relating students' experiences	02

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

	1.5 Reviews the mechanical support and movements in organisms.	• Mechanical support·
		• Movement·
		  • Bone-muscle, joints
		• Plant movements
		  • Tropic
		  • Nastic
			Student should be able to;
			• explain the movement and mechanical support of animals using bones – muscles and joints.
			• explain support in plants.
			• demonstrate tropic and nastic movements of plants.
			• appreciate the importance of in-situ conservation of plants as they are immovable unlike animals.
				• Demonstration of movement of muscle should be done by the teacher using teaching aids.
				• Discuss students' experiences on plant movement
					3

	1.6 Explores the importance of the evolutionary process in bio-diversity	• Evolution of living organisms.
		  • Origin of earth and life
		  • Evolution
		  • Evidence in support of evolution·
		  • Importance of evolution in bio-diversity
			Student should be able to;
			• state simply the notion bout the origin of the planet Earth.
			• state that life originated as a result of a bio-chemical process.
			• state that evolution is the emergence of living beings at present from the simple organisms lived at the beginning.
			• describe the importance of fossils among other evidence which support evolution.
			• demonstrate how a fossil is created using a simple activity.
			• state that bio-diversity is a result of evolution.
			• accept that the future of bio-diversity depends on the process of evolution.
				• How to create fossils should be done as a home assignment
				• Assignment should be done for origin of earth and evolution
					3

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
2.0 Explores properties and interactions of matter with the aim of promoting quality of life.	2.2 Inquires into Electrochemical processes.	• Electrolysis • Electrolyte • Positive electrode • Negative electrode • Acidulated water • Sodium chloride solution	**Student should be able to;** • identify an electrolyte and an non-electrolyte by simple activities.·(teacher demonstration) • state that in order to conduct electricity, the electrolyte should contain mobile ions. • electrolyze acidulated water using inert (carbon) electrodes.· • identify and name the positive electrode, negative electrode and the electrolyte. • identify by simple tests the products discharged at the respective electrodes during the electrolytic processes stated above. • state that the splitting of a chemical substance into more simpler substances is called electrolysis. • state that the constituent ions in some substances can be made mobile by melting (fusion) or dissolving in suitable solvents.	• Electroplating and electrolysis will be discussed in grade 11	4

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

3.0 Utilizes various forms of energy, their interaction with matter and energy transform at by maintaining efficiency and effectiveness at an optimum level	3.1 Identifies basic concepts related to force.	• Force
		  • Magnitude
		  • Point of application
		  • Diagrammatic representation
			Student should be able to;
			• state that unite use to measure magnitude of force is newton (N).
			• measure the magnitude of force correctly using the newton spring balance correctly.
			• carry out simple activities to show that a force has a magnitude, direction and a point of application.
			• state that force is a vector quantity.
			• illustrate diagrammatically the magnitude, direction and the point of application of a force.
			• accept that the point of application and direction of a force can be changed appropriately to make tasks easier in day to day life.
				• Competency levels 3.1 and 3.2 should be combined
				• Force and pressure concepts should be discussed using general examples and experiences
					07

	3.2 Utilizes the pressure exerted by solids effectively in day to day life.	• Pressure • Factors affecting to pressure • Units of pressure	**Student should be able to;** • explain the concept of pressure taking day to day experiences as examples. • state that force and the area on which the force acts affect pressure.		

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
			• Explain force affects the pressure exerted by a solid using examples • Explain the surface area on which the force acts affects pressure exerted by a solid using examples • derive the relationship between the perpendicular force and the surface area on which the force acts for pressure. • state that the unit of pressure is N/m^2 or Nm^{-2}. • use Pascal (Pa) as a unit of measuring pressure. • solve simple problems using the relationship, $\text{Pressure} = \frac{\text{Perpendicular force}}{\text{Surface area on which the force acts}}$ • accept that the factors affecting pressure can be appropriately changed in instances where the pressure exerted by the solid objects need to be increased or decreased.		

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
	3.3 Applies effectively the principles of reflection and refraction of rays for day to day tasks.	• Reflection of light • Diffuse reflection • Regular reflection • Incident ray • Refracted ray • Normal to the point of incidence • Angle of incidence • Angle of reflection • Laws of reflection • Characteristics of the images formed by a plane mirror • Ray diagrams	**Student should be able to;** • discuss laws of reflection, diffuse reflection and regular reflection • carry out a simple activity to identify the incident ray, reflected ray, normal to the point of incidence, angle of incidence and angle of reflection. • state laws of reflection of light. • explain regular reflection using a parallel beam of light. • explain diffuse reflection using a parallel beam of light. • illustrate by a ray diagram how the image of a point object placed in front of a plane mirror is perceived by the eye. • describe uses of regular reflection and diffuse reflection • describe the characteristics of images formed by a plane mirror • engage in simple activities to show that sound can be reflected. • state that echo and reverberation are results	• Refraction will be discussed in grade 11. (Note: Although Reflection is discussed in grade 11 it's introduction should be done in grade 9)	06

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

		• Reflection of sound
		  • Echo
		  • Reverberation
			• state applications of the reflection of sound.
			• suggest methods to remove barriers for reflection of sound.		

	3.4 Uses simple Machines effectively to facilitate day to day activities	• Machines
		• Simple machines
		  • Effort
		  • Fulcrum
		  • Effort arm, load arm
		  • Mechanical advantage
		  • Velocity ratio
		  • Efficiency
		• Levers
		• Classes of levers
		• Inclined plane
		• Wheel and axel
		• Pulleys
			Student should be able to;·
			• explain a machine.
			• present examples to indicate how work is facilitated by machines.
			• state that lever, inclined plane, wheel and axle and pulleys are used as simple machines.·
			• introduce the load, effort and fulcrum of a lever by a simple activity.·
			• name the force applied on the lever as the effort, the force that is overcome by the effort as the load and the point/axis around which the effort and the load tend to rotate as the fulcrum.·
				Teacher demonstrations and discussion based on students' experiences should be done	**08**

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
			• demonstrate through simple activities the instances where levers are used in relation to the placement of the fulcrum the effort and the load.· • indicate advantages in using levers belonging to different classes and examples met in day to day life for them.· • demonstrate through activities how levers can be used more profitably.· • present a simple activity to show that the inclined plane is a simple machine. • state the occasions where inclined planes are used in day to day life. • show by an activity that the mechanical advantage of the inclined plane changes with the slope of the plane. • show by an activity that wheel and axle is a simple machine. • demonstrate through a simple activity how wheel and axle can be used more profitably.		

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
			• give examples for the instances of using wheel and axle more profitably. • explain through an activity that the immovable pulley is a simple machine. • demonstrate the ways of coupling movable pulleys with immovable pulleys to facilitate work. • present examples for the uses of pulley systems. • demonstrate complex machines are created by the combination of a number of machines using an appropriate machine. • appreciate the contribution of machines for the technological development entailing a comfortable life.		

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
	3.5 Uses the concept of density in day to day tasks effectively .	• Density • Density = mass/volume • Hydrometer	**Student should be able to;**· • explain the relationship between the mass and volume of a liquid through an activity. • introduce density as the mass per unit volume.· • plan activities to measure the densities of various substances.· • state that the unit of density is kgm^{-3}.· • solve simple problems relating to density.· • indicate examples for the instances where the concept of density is used in the events of everyday life.· • create a simple hydrometer and uses it to compare the densities of various liquids.· • appreciate the use of the concept of density in determining the quality of various liquids and solutions.	• Teacher demonstrations • Simple activities at home for further experiences	03

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
4.0 Explores nature, properties and processes of the Earth and space by understanding natural phenomena for intelligent and sustainable utilization	4.1 Inquires into nanotechnology and its applications.	• Nanotechnology • Introduction of nanotechnology • Nanometer • Application of nanotechnology • Future of nanotechnology.	**Student should be able to;** • state that the size 10^{-9}m is a nanometer. • accept that the nanometer is a very small unit of measurement. • state that nanotechnology is a process carried out using materials in the range of 1nm - 100 nm. • present examples for nano scale natural phenomena/ processes. • describe how lotus effect is brought about. • describe the process happening in non – wettable clothes using the lotus effect. • explain simply the adsorption process of activated carbon as another application of nanotechnology. • give examples for other applications of nanotechnology. • predict other possible conditions in nanotechnology in the future.	• Teacher should explain the basic theory of Nano technology. • Assignment for students should be given to find out the usage of Nano Technology.	**03**

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

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	4.2 Investigates into the prevention of accidents due to lightning.
		• How lightning is caused
		• Lightning accidents
		  • Prevention
		  • safety
			Student should be able to;
			• explain simply how clouds get electrically charged.
			• state that lightning occurs due to charges in the clouds get discharged in various ways.
			• state that sudden expansion of air owing to the current generated by discharge causes thunder.
			• state precautions that can be taken to prevent lightning accidents.
			• describe how safety can be ensure when lightning strikes.
			• accept that loss of lives and properties due to lightning which is a natural phenomenon can be prevented.
				• Teacher should explain the basic theory of lightning.
				• Students should find out prevention and safety measures on lightning
					02

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
	. 4.3 Inquires into the scientific back-ground of natural disasters.	▪ Natural disasters ▪ Whirl wind and storms • Earthquakes and earth tremors • Tsunami • Wild fires	**Student should be able to;**· • state that the reason for the greater tendency for some natural disasters is the increase in global warming. • name a few factors affecting the increase in global warming.· • state that the depressions in the atmosphere is the cause for depressions whirl winds and storms.· • forward a report on the losses of lives and property caused by whirl winds and storms in Sri Lanka during past 50 years. • explain simply the geological factors leading to earthquakes and earth tremors. • explain simply the causes leading to a tsunami states. • state that the earthquakes and tsunami tend to occur along the tectonic plate margins of the Earth. • present a report on the tsunami conditions emerged globally. • explain simply the conditions leading to wild fires. • present information about the wild fires erupted globally. • accepts that natural disasters cannot be prevented but the loss can be minimized by awareness and preparedness.	• Teacher should discuss basic theory of storms, earthquakes, tsunami and wildfires • Students should find other factors on this phenomena and relevant historical incidents .	05

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
	. 4.4 Investigates on biodiversity	• Introduction to biodiversity· • Importance of biodiversity· • Threats to biodiversity • Natural eco systems and built environment • Eco systems in Sri Lanka • Aquatic • Rivers • Estuaries/lagoons • Riverine • Inland waters • Ocean • Wetlands • Terrestrial • Forests • Tropical rain forests • Montane forests • Dry mixed evergreen forests • Thorn bushes and scrublands • Grasslands • Wet patana • Dry patana • Damana and thalawa • Villu	**Student should be able to;**· • state what is Bio diversity. • describe the importance of Bio diversity· • explain threats to Bio diversity • state the important features of eco systems· • give examples for natural and artificial ecosystems. • list major eco systems and their locations in Sri Lanka • accept the importance of biodiversity for existence of earth	• Biodiversity will be discussed in grade 10 • Interactions will be discussed in grade 11 • Ecosystems (terrestrial and aquatic) in Sri Lanka should be done as assignments	03

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)
	. 4.5 Investigates on artificial environment and green concept	• Artificial environment· • Green concept • Agriculture • Organic farming· • Water management • Land management • Post harvesting technology· • Industrial processes· • Usage of chemicals • Construction· • Green transportation	**Student should be able to;**· • explain simply about artificial environment and green concept. • describe the importance of using organic fertilizers over the inorganic fertilizers. • prepare a report on the traditional agricultural methods that can be used to control pests. • discuss the importance of correct water management in farming. • describe the importance of maximum use of cultivated lands in farming related to reducing forest cover. • state scientific basis of using mixed crop farming and agricultural land management. • state the harmful effects of using chemicals in food production, food transportation, food storage and food preservation. • state the importance of using post harvest technology in food security to minimize waste of foods. • tabulate the chemicals used in industries and their harmful effects on environment. • describe the importance of disposal of chemicals used in industries in a safe way.	• Explain green concept • Students should discuss how they can use green concept at home • Assignments should be done by the students on how the green concept is used globally	04

Competency	Competency level	Contents	Outcomes	Remark	Time (Periods)

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	4.6 Identification of natural resource distribution and sustainable use of natural resources.
		• Natural resources
		  • Water
		  • Minerals and rocks (gems)
		  • Plants
		  • Wood
		• Sustainable use of natural resources
		  • Importance
		  • Strategies
			• state the importance of construction of environment friendly building in relation to power saving.
			• appreciate the use of green transportation.
			
			Student should be able to;·
			• explain briefly about natural resources.
			• explain simply sustainable use of water. (using rain water harvesting)
			• state available methods used to extract minerals from soil.
			• state characteristic features of gems.
			• list different types of gems.
			• present a report about adverse effects caused to the environment and to the human due to gem mining industry.
			• give examples of plants for various uses of them as natural resources.
			• collect and present information of different types of wood in Sri Lanka and their specific uses.
			• explain scientific basis of wood decomposition
			• list out the methods used to prevent wood decomposition.
			• accept the importance of
				• Briefly discuss natural resources
				• Briefly discuss characteristics of minerals .Details of minerals not required
					03

			sustainable use of natural resources.		